This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): An apparatus for conducting a microfluidic process and analysis, said apparatus comprising:

a first substrate having at least one exterior edge;

at least one elongated separation channel in the first substrate, the separation channel having an inlet end and an outlet end transiting the at least one exterior edge;

a fluidic transport means for transport of fluids through the separation channel;

a second substrate; and

at least one thick-film electrode for analyte detection on the second substrate, the thick-film electrode being in fluidic connection with the outlet end of the separation channel.

Claim 2 (previously presented): The apparatus of claim 1, wherein the fluidic transport means comprises a conductive system in fluidic connection with each end of the separation channel for application of a separation voltage.

Claim 3 (original): The apparatus of claim 2, wherein the conductive system comprises electrodes.

Claim 4 (original): The apparatus of claim 2, further comprising a high-voltage power supply for application of voltage to the conductive system.

Claim 5 (previously presented): The apparatus of claim 1, wherein the fluidic transport means comprises electrokinetic fluid transport.

Claim 6 (previously presented): The apparatus of claim 1, wherein the fluidic transport means comprises at least one means elected from the group consisting of electrical, mechanical, centrifugal, magnetic, pneumatic, pressure-activated, and vacuum-activated fluid transport.

Claim 7 (original): The apparatus of claim 1, further comprising at least one reference electrode in fluidic connection with the thick-film electrode.

Claim 8 (original): The apparatus of claim 1, wherein the first substrate comprises at least one member selected from the group consisting of fused-silica, silica-based, polymer, plastic and elastomer substrates.

Claim 9 (original): The apparatus of claim 1, wherein the second substrate comprises at least one member selected from the group consisting of ceramic, polymeric and plastic substrates.

Claim 10 (original): The apparatus of claim 1, further comprising an electrical contact to the thick-film electrode.

Claim 11 (original): The apparatus of claim 10, further comprising an analyte analysis system in electrical contact with the electrical contact to the thick-film electrode.

Claim 12 (original): The apparatus of claim 1, further comprising an analyte analysis system for analyzing an analyte at the thick-film electrode.

Claim 13 (original): The apparatus of claim 12, wherein the analyte analysis system comprises an amperometric detection system.

Claim 14 (previously presented): The apparatus of claim 13, wherein the amperometric detection system comprises at least one member selected from the group consisting of fixed potential and potential-step amperometric detection systems.

Claim 15 (original): The apparatus of claim 12, wherein the analyte analysis system comprises at least one member selected from the group consisting of a stripping potentiometry system and a voltammetric detection system.

Claim 16 (original): The apparatus of claim 1, wherein the thick-film electrode is a screen-printed electrode.

Claim 17 (original): The apparatus of claim 1, wherein the separation channel has an average bore diameter of from about 1 μm to about 300 μm.

Claim 18 (previously presented): The apparatus of claim 17, wherein the separation channel has an average bore diameter of from about 20 μm to about 120 μm.

Claim 19 (original): The apparatus of claim 1, wherein the thick-film electrode has a thickness of from about 1 μm to about 100 μm.

Claim 20 (original): The apparatus of claim 19, wherein the thickness of the thick-film electrode is between about 8 μm and 30 μm.

Claim 21 (original): The apparatus of claim 1, wherein the first substrate comprising at least one elongated separation channel is detachable from the second substrate comprising at least one thick-film electrode.

Claim 22 (original): The apparatus of claim 21, wherein the first substrate is affixed to the second substrate such that the distance between the thick-film electrode and the outlet end of the separation channel is fixed.

Claim 23 (original): The apparatus of claim 22, wherein the distance between the thick-film electrode and the outlet end of the separation channel is from about 1 μm to about 500 μm.

Claim 24 (original): The apparatus of claim 23, wherein the distance is between about 50 μm and about 100 μm.

Claim 25 (original): The apparatus of claim 1, wherein the thick-film electrode comprises a carbon ink electrode.

Claim 26 (original): The apparatus of claim 1, wherein the thick-film electrode comprises a metal conducting coating.

Claim 27 (original): The apparatus of claim 1, wherein the thick-film electrode comprises at least one member selected from the group consisting of metals, inorganic dopants, organic dopants, nucleic acids, catalytic surface modifiers, enzymatic surface modifiers, and permselective film coatings.

Claim 28 (original): The apparatus of claim 1, further comprising at least one cavity in fluidic connection with the inlet end of the separation channel.

Claim 29 (original): The apparatus of claim 28, further comprising a buffer cavity and sample cavity in fluidic connection with the inlet end of the separation channel.

Claim 30 (original): The apparatus of claim 28, further comprising a reaction cavity in fluidic connection with the inlet end of the separation channel.

Claim 31 (previously presented): The apparatus of claim 28, further comprising a plurality of separation channels with the inlet ends thereof in fluidic connection with at least one cavity.

Claim 32 (original): The apparatus of claim 1, further comprising at least one cavity in fluidic connection with the outlet end of the separation channel.

Claim 33 (original): The apparatus of claim 1, comprising a plurality of separation channels and a plurality of thick-film electrodes.

Claim 34 (original): The apparatus of claim 1, wherein both the first substrate and the second substrate are substantially planar, and the second substrate is at an angle to the first substrate.

Claim 35 (original): The apparatus of claim 34, wherein the second substrate is perpendicular to the first substrate.

Claim 36 (original): The apparatus of claim 1, wherein both the first substrate and the second substrate are substantially planar and parallel to each other.

Claim 37 (original): The apparatus of claim 36, wherein the second substrate forms a seal for at least a portion of the separation channel of the first substrate.

Claim 38 (original): The apparatus of claim 1, wherein the separation channel further comprises separation media.

Claim 39 (previously presented): A method for detecting an analyte, comprising the steps of:

providing a substrate with a microfluidic channel disposed thereon, the microfluidic channel having an inlet end and an outlet end transiting an exterior edge of the first substrate;

introducing the analyte in the inlet end of the microfluidic channel;

transporting the analyte in a fluid solution through the microfluidic channel to the outlet end;

contacting the solution containing the analyte with a thick-film electrode disposed on a second substrate and in fluidic connection with the outlet end of the microfluidic channel;

providing electrical contact to the thick-film electrode; and

analyzing the analyte at the thick-film electrode by electrochemical detection.

Claim 40 (original): The method of claim 39 further comprising the step of:

providing electrical contact to at least one counter electrode in fluidic contact with the thick-film electrode.

Claim 41 (original): The method of claim 39 further comprising the steps of:

providing at least one reactant for the analyte; and

mixing the at least one reactant and the analyte prior to analyzing the analyte at the thick-film electrode by electrochemical detection.

Claim 42 (original): The method of claim 39, wherein the microfluidic channel comprises a microfluidic separation channel.

Claim 43 (original): The method of claim 39, wherein transporting the analyte in a fluid solution through the microfluidic channel is by electrokinetic fluid transport.

Claim 44 (previously presented): The method of claim 43, wherein the electrokinetic fluid transport is capillary electrophoresis.

Claim 45 (original): The method of claim 39, wherein transporting the analyte in a fluid solution through the microfluidic channel comprises at least one method selected from the group consisting of electrical, mechanical, centrifugal, magnetic, pneumatic, pressure-activated, and vacuum-activated fluid transport.

Claim 46 (original): The method of claim 39, wherein analyzing the analyte at the thick-film electrode by electrochemical detection comprises amperometric detection.

Claim 47 (original): The method of claim 46, wherein the amperometric detection comprises at least one member selected from the group consisting of fixed potential and potential-step amperometric detection.

Claim 48 (original): The method of claim 39, wherein analyzing the analyte at the thick-film electrode by electrochemical detection comprises at least one member selected from the group consisting of stripping potentiometry and voltammetric detection.

Claim 49 (original): The method of claim 39, wherein the thick-film electrode is a screen-printed electrode.

Claim 50 (original): The method of claim 39, wherein the microfluidic channel has an average bore diameter of from about 1 μm to about 300 μm.

Claim 51 (original): The method of claim 50, wherein the microfluidic channel has an average bore diameter of from about 20 μm to about 120 μm.

Claim 52 (original): The method of claim 39, wherein the thick-film electrode has a thickness of from about 1 μm to about 100 μm.

Claim 53 (original): The method of claim 52, wherein the thickness of the thick-film electrode is between about 8 μm and 30 μm.

Claim 54 (original): The method of claim 39, wherein the distance between the thick-film electrode in fluidic connection with the outlet end of the microfluidic channel and the microfluidic channel is fixed.

Claim 55 (original): The method of claim 54, wherein the distance between the thick-film electrode and the outlet end of the microfluidic channel is from about 1 μm to about 500 μm.

Claim 56 (original): The method of claim 55, wherein the distance is between about 50 μm and about 100 μm.

Claim 57 (original): The method of claim 39, wherein the thick-film electrode comprises a carbon ink electrode.

Claim 58 (original): The method of claim 39, wherein the thick-film electrode comprises a metal conducting coating.

Claim 59 (original): The method of claim 39, wherein the thick-film electrode comprises at least one member selected from the group consisting of metals, inorganic dopants, organic dopants, nucleic acids, catalytic surface modifiers, enzymatic surface modifiers, and permselective film coatings.

Claim 60 (original): The method of claim 39, wherein the fluid solution comprises a buffer solution.

Claim 61 (original): The method of claim 39, wherein the analyte comprises at least one member selected from the group consisting of nitroaromatic compounds, catecholamines, hydrazine compounds, phenolic compounds, enzyme-specific compounds, amino acids, nucleic acids, metal ions and anions.

Claim 62 (previously presented): The method of claim 61, wherein said nucleic acids are selected from the group consisting of DNA, scDNA, ssDNA, dsDNA, RNA and tRNA.

Claim 63 (original): The method of claim 39, wherein the microfluidic channel further comprises separation media.

Claim 64 (currently amended): An apparatus for conducting a microfluidic process and analysis, said apparatus comprising:

a first substantially planar substrate having at least one defined edge;

at least one elongated separation channel in the first substrate, the separation channel having an inlet end and an outlet terminating at a defined edge;

a second substrate with at least one thick-film electrode for analyte detection disposed thereon, the second substrate being removably positionable with respect to the first substrate and ~~; and~~

~~at least one thick-film electrode for analyte detection disposed on the second substrate,~~ the thick-film electrode being in fluidic connection with the outlet end of the separation channel.

Claim 65 (currently amended): The apparatus of claim 64, wherein the second substrate is removably positionable at ~~an~~ a non-zero angle to the first substrate.

Claim 66 (previously presented): The apparatus of claim 65, wherein the second substrate is removably positionable perpendicular to the first substrate.

Claim 67 (previously presented): The apparatus of claim 64, wherein the second substrate is substantially planar and is removably positionable parallel to the first substrate.

Claim 68 (previously presented): The apparatus of claim 64, further comprising a holder for holding the first substrate in a removably positionable position with respect to the second substrate.

Claim 69 (previously presented): The apparatus of claim 68, wherein the first substrate is attached to the holder and the second substrate is removably attached to the holder.

Claim 70 (previously presented): The apparatus of claim 68, wherein the first substrate and the second substrate are removably attached to the holder.

Claim 71 (previously presented): The apparatus of claim 64, further comprising a conductive system in fluidic connection with each end of the separation channel for application of a separation voltage.

Claim 72 (previously presented): The apparatus of claim 64, further comprising an electrokinetic fluid transport system.

Claim 73 (previously presented): The apparatus of claim 64, further comprising a fluidic transport means for transport of fluid through the separation channel comprising at least one means elected from the group consisting of electrical, mechanical, centrifugal, magnetic, pneumatic, pressure-activated, and vacuum-activated fluid transport.

Claim 74 (previously presented): The apparatus of claim 64, further comprising at least one reference electrode in fluidic connection with the thick-film electrode.

Claim 75 (previously presented): The apparatus of claim 64, wherein the thick-film electrode is a screen-printed electrode.

Claim 76 (previously presented): The apparatus of claim 64, wherein the thick-film electrode has a thickness of from about 1 μm to about 100 μm.

Claim 77 (previously presented): The apparatus of claim 76, wherein the thickness of the thick-film electrode is between about 8 μm and 30 μm.

Claim 78 (previously presented): The apparatus of claim 64, wherein the second substrate is adjustably positionable relative to the first substrate such that the distance between the thick-film electrode and the outlet of the separation channel is variably and adjustably positionable.

Claim 79 (previously presented): The apparatus of claim 78, wherein the distance between the thick-film electrode and the outlet of the separation channel is from about 1 μm to about 500 μm.

Claim 80 (previously presented): The apparatus of claim 79, wherein the distance is between about 50 μm and about 100 μm.

Claim 81 (previously presented): The apparatus of claim 64, wherein the thick-film electrode comprises a carbon ink electrode.

Claim 82 (previously presented): The apparatus of claim 64, wherein the thick-film electrode comprises a metal conducting coating.

Claim 83 (previously presented): The apparatus of claim 64, wherein the thick-film electrode comprises at least one member selected from the group consisting of metals, inorganic dopants, organic dopants, nucleic acids, catalytic surface modifiers, enzymatic surface modifiers, and permselective film coatings.

Claim 84 (previously presented): The apparatus of claim 64, comprising a plurality of separation channels and a plurality of thick-film electrodes.